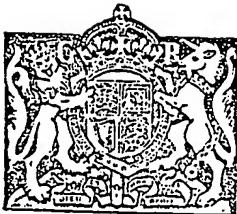


# PATENT SPECIFICATION



Application Date: Dec. 24, 1931. No. 35,652 / 31.

392,999

Complete Left: Dec. 23, 1932.

Complete Accepted: June 1, 1933.

## PROVISIONAL SPECIFICATION.

### An Improved Rotary Fluid Pressure Pump.

We, REGINALD WARREN, a British Subject, of "Gorran Haven", Godfrey Avenue, Witton, Middlesex, and the PULSOMETER ENGINEERING COMPANY LIMITED, a British Company, of Nine Elms Iron Works, Oxford Road, Reading, Berks., do hereby declare the nature of this invention to be as follows:—

This invention relates to a rotary pump of a type having a revolving rotor set eccentrically within a casing and having one or more relatively sliding vanes operating in slots in the rotor, and has for its object the reduction of wear on the 15 vanes, casing and rotor slots in the manner set forth.

According to this invention, the amount of eccentricity of the rotor within the casing is relatively small, so that the vane 20 or vanes may be carried diametrically across the rotor, to within a small working clearance of the casing, a plurality of the vanes being all of the same length.

In one example having two diametrical 25 vanes, each vane is thickened at its centre of rotation, and so shaped as to form a relatively wide web joining the two end portions of the vane which are carried in the rotor slots, the web being in a plane 30 at right angles thereto. The said web is formed at unequal distances from the front edge of each vane, so that the web of one vane may pass across the centre of the rotor behind the web of the other 35 vane. At each juncture of the web with the vane ends, a flat surface is formed at right angles to the web and the vane axis.

These opposite flat surfaces on each vane operate in sliding contact with the respective opposite sides of a substantially square block which rotates on a pin located on the cover and concentric with the bore of the casing. Centrifugal force on the vanes is thus nullified, and the vane tips are positively held out of contact with the casing bore by the centre block and pin, and each vane being supported at diametrically opposite points in the rotor, wear is minimised between the vane surfaces and the slots within which the vanes operate.

The rotor is formed with a hollow centre to accommodate the thickened portions of the vanes with the block and pin. The vanes may be one or more in number, 55 the sliding surfaces of the block being in direct proportion to the number of vanes.

In a modification, the centre block and pin may be dispensed with and the vane centres or webs arranged across each other in "staggered" formation, thus nullifying centrifugal force in opposite vane ends, without locating the vanes upon any given centre.

The vane formation above described may be adapted to a standard centrifugal pump impeller to effect a positive suction.

Dated this 24th day of December, 1931.

REGINALD WARREN.

For and on behalf of  
THE PULSOMETER ENGINEERING  
COMPANY, LIMITED,  
C. E. HODGKIN,  
Director & Secretary.

## COMPLETE SPECIFICATION.

### An Improved Rotary Fluid Pressure Pump.

We, REGINALD WARREN, a British Subject, of "Gorran Haven", Godfrey Avenue, Whitton, Middlesex, and THE PULSOMETER ENGINEERING COMPANY LIMITED, a British Company, of Nine Elms Iron Works, Oxford Road, Reading, Berkshire, do hereby declare the nature 75 of this invention and in what manner the same is to be performed, to be particu-

larly described and ascertained in and by the following statement:—

This invention relates to pumps of the type in which a double ended vane carried diametrically across a rotor set eccentrically within a cylindrical casing is caused to slide relatively to such rotor while the latter revolves and sweeps the vane around the casing, and the object of:

[Page 1]

the present invention is to enable a pump of this type to be produced with a plurality of double ended vanes in an improved manner.

5 To this end the vanes are formed, intermediate of the ends which are carried in the rotor slots, with webs in planes at right angles thereto, the webs being so differently spaced that the web of one 10 vane passes across the centre of the rotor adjacent to the web of another and each being furthermore formed with opposite flat surfaces so that collectively a pocket is constituted for reception of a positioning block with which each double vane is in independent sliding engagement. The 15 positioning block with which the vanes are associated may maintain the desired angular relationship between the vanes independently of the rotor slots, and in 20 either case the multiple vane combination may be located upon a given centre during operation.

But in order that the invention may be 25 more readily understood one specific example of pump having two diametrical vanes will now be described with the aid of the accompanying drawings from which modifications will be readily ascertainable.

30 Of these drawings, Fig. 1 is an end view of the pump with parts removed and parts in section. Fig. 2 is a part sectional side elevation. Fig. 3 comprises two 35 views at right angles to one another of one of the vanes of such pump. Fig. 4 comprises two similar views of the companion vane and Fig. 5 comprises two equivalent views of a member interconnecting the two vanes. Fig. 6 represents 40 in perspective the two vanes of Figs. 3 and 4 in position ready to be interconnected by the member of Fig. 5.

According to this example each diametrical vane is thickened at its centre of rotation and so shaped as to form a relatively wide web joining the two end portions of the vane which are carried in the rotor slots, the web being in a plane at right angles thereto. The said webs of 45 the two vanes are so differently spaced that the web of one vane may pass across the centre of the rotor behind the web of the other. Thus the vane 1 which slides 50 in one pair of slots in the rotor 2 has a web 3 which coincides with one edge of the vane while the companion vane 4 has a web 5 located at a distance from the corresponding edge equal to the thickness 55 of the web 3, so that the two vanes can be assembled as clearly indicated in Fig. 6. At each junction of the web 3 or 5 60 with the vane ends, a flat surface 6 is formed at right angles to the web and major vane axis. These opposite flat sur-

faces on each vane are in sliding contact with the respective sides 7 of a square block 8 which rotates on a pin 9 located on the cover 10 and concentric with the bore of the casing 11 which as ordinarily 70 has inlet and outlet ports 12, 13. The arrangement is such that centrifugal force on the vanes 1, 4 is nullified and the vane tips are positively held out of contact with the casing bore by the centre block 8 and pin 9. The cooperating flat surfaces 6, 7 of the vanes and block maintain the angular relationship of the vanes independently of the slots in the rotor which in itself tends to lessen wear between the vane surfaces and the slots within which they work just as the support of the vanes at diametrically opposite points in the rotor does. On the other hand it will be apparent that the end contact of the vanes with the casing may be prevented by a block which is not necessarily square like the block 8 but might even be circular. Nor is it necessary to employ an intermediate block at all to achieve this object as a circular boss on the cover 10 would serve as a positioning block and secure a like result, the pin 9 in other words being suitably increased in diameter to engage the surfaces 6. 85

90 The rotor 2 is formed with a hollow centre to accommodate the thickened portions of the vanes with the block and pin, as clearly seen in Fig. 1.

The vane formation above described 95 may be adapted to a standard centrifugal pump impeller to effect a positive suction.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to 105 be performed, we declare that what we claim is:—

1. A pump of the kind herein referred to wherein the vanes are formed, intermediate of the ends which are carried in the rotor slots, with webs in planes at right angles thereto, the webs being so differently spaced that the web of one vane passes across the centre of the rotor adjacent to the web of another and each being furthermore formed with opposite flat surfaces so that collectively a pocket is constituted for the reception of a positioning block with which each double vane is in independent sliding engagement. 110

2. A pump according to claim 1 in which the positioning block maintains the desired angular relationship between the vanes independently of the rotor slots in 115 which the vanes slide.

3. A pump according to claim 1 or claim 2 in which means are provided for locating the vanes upon a given centre during 120 operation.

4. A rotary fluid pressure pump having  
its several parts constructed, arranged  
and adapted for use substantially as  
described and illustrated in the accom-  
panying drawings.

Dated this 23rd day of December, 1932.

For the Applicants,

LLOYD WISE & Co.,

10, New Court, Lincoln's Inn, London,  
W.C. 2,

Chartered Patent Agents.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1933.

392.999 COMPLETE SPECIFICATION

[This Drawing is a reproduction of the Original on a reduced scale.]

FIG. 1.

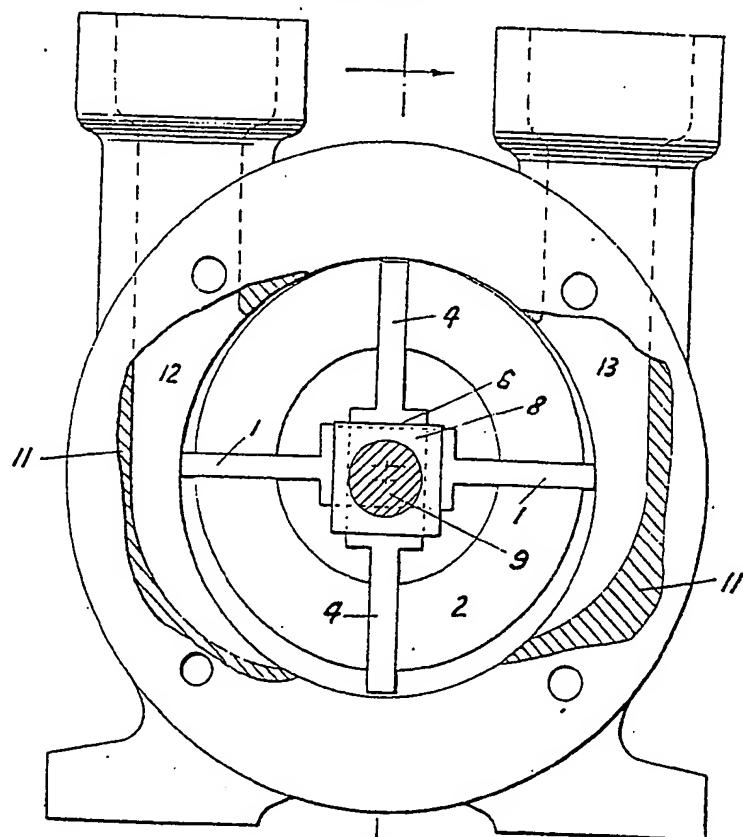


FIG. 4.

FIG. 3.

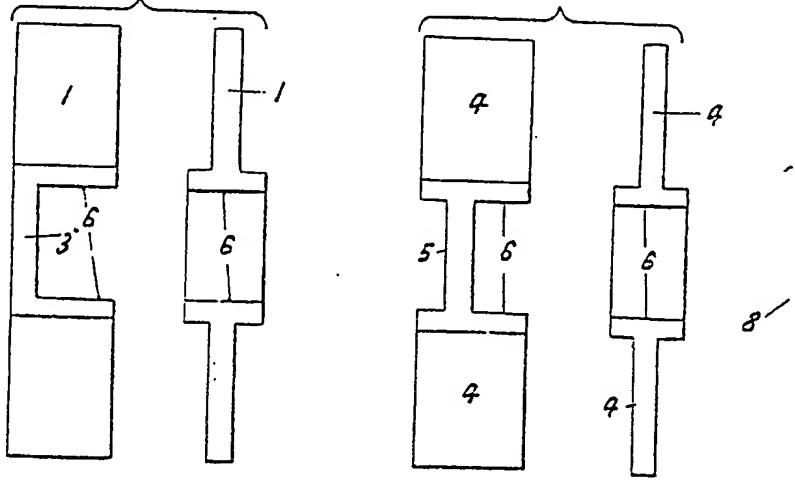


FIG. 2.

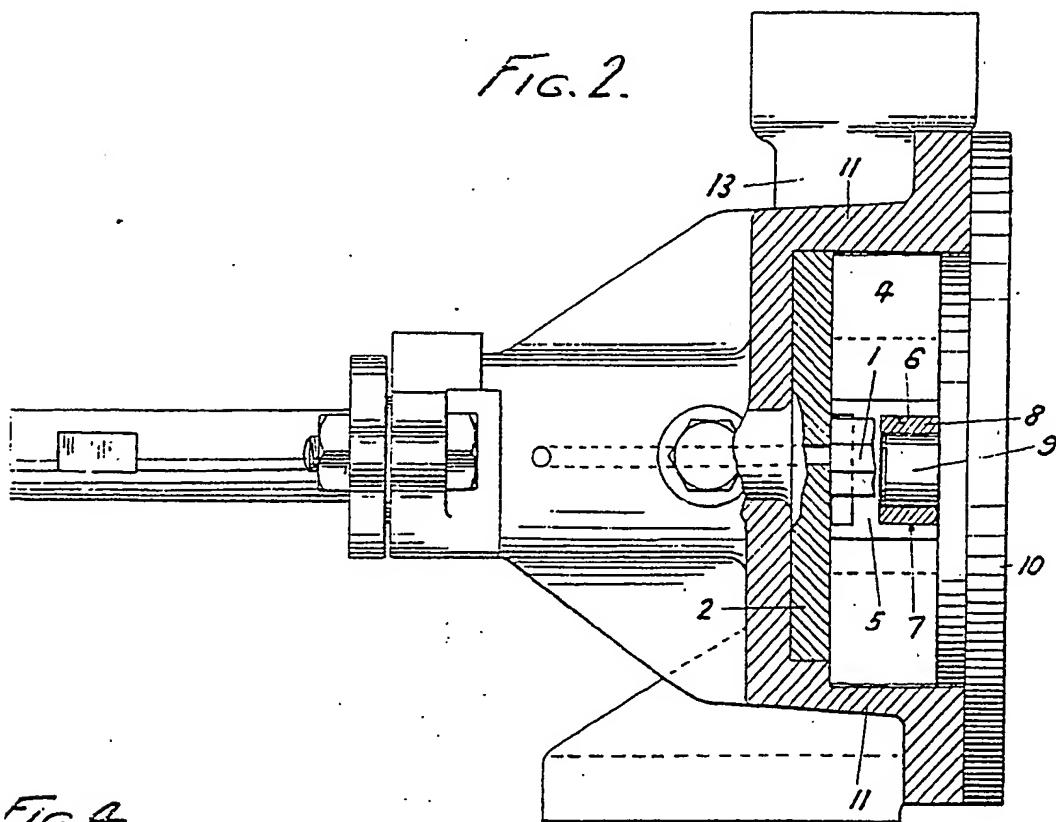


FIG. 4.

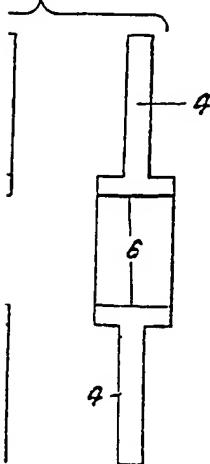


FIG. 5.

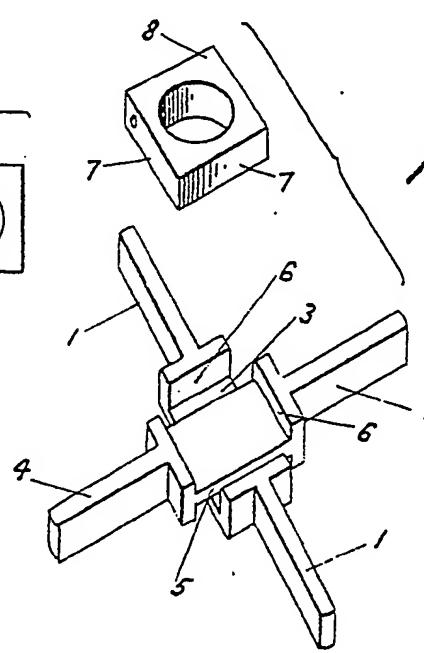
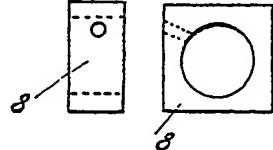


FIG. 6.

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1 SHEET

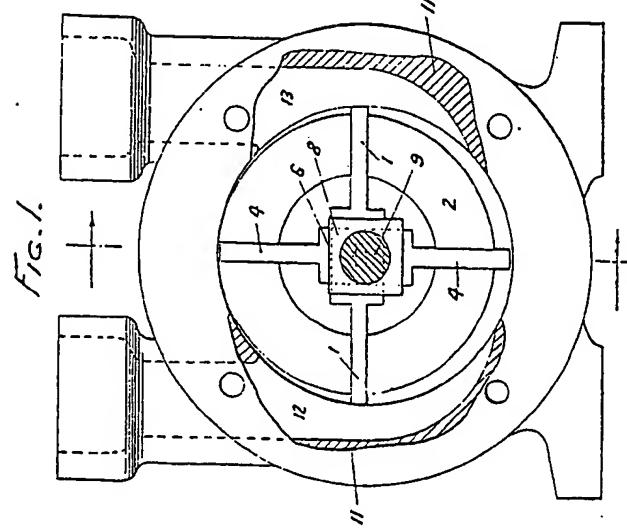


FIG. 1.

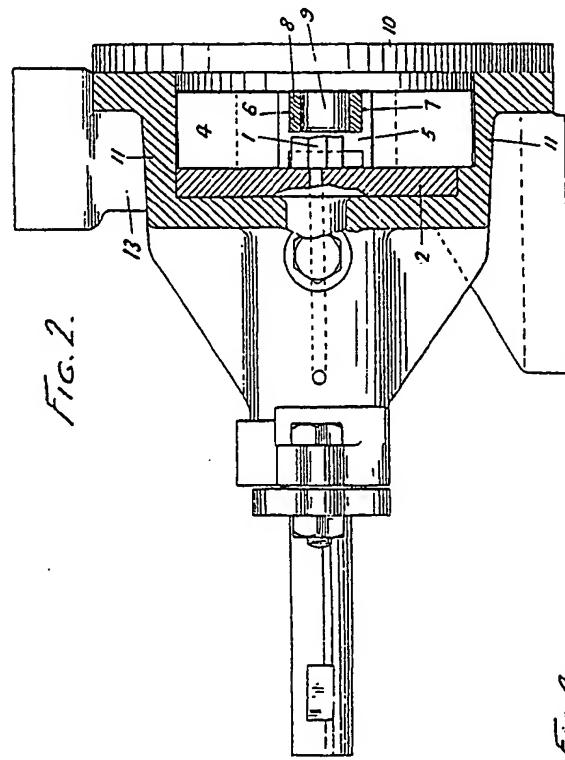


FIG. 2.

FIG. 3.

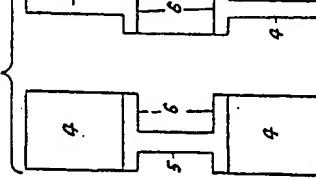
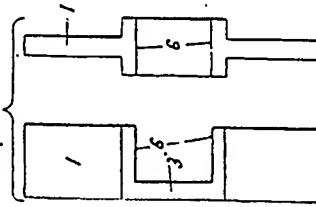


FIG. 4.

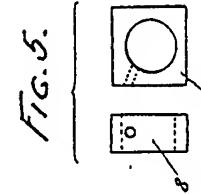


FIG. 5.

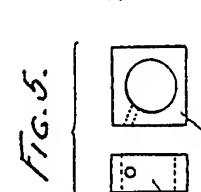


FIG. 6.